



## ON THE COVER:

Acute kidney injury (AKI) remains a major cause of postoperative morbidity and patients with preoperative hypoalbuminemia may be at higher risk. In this issue of ANESTHESIOLOGY, Lee and colleagues demonstrate that immediate preoperative administration of 20% albumin solution reduced the incidence of AKI after off-pump coronary artery bypass surgery.

- Lee *et al.*: Effect of Exogenous Albumin on the Incidence of Postoperative Acute Kidney Injury in Patients Undergoing Off-pump Coronary Artery Bypass Surgery with a Preoperative Albumin Level of Less Than 4.0 g/dl, p. 1001
- Jiang and Shaw: Albumin Supplementation as a Therapeutic Strategy in Cardiac Surgery: Useful Tool or Expensive Hobby?, p. 983

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## CLINICAL SCIENCE

- ◆◆🌐 **Effect of Exogenous Albumin on the Incidence of Postoperative Acute Kidney Injury in Patients Undergoing Off-pump Coronary Artery Bypass Surgery with a Preoperative Albumin Level of Less Than 4.0 g/dl** 1001  
*E.-H. Lee, W.-J. Kim, J.-Y. Kim, J.-H. Chin, D.-K. Choi, J.-Y. Sim, S.-J. Choo, C.-H. Chung, J.-W. Lee, and I.-C. Choi*  
 Administration of 20% exogenous albumin immediately before surgery significantly reduces the risk of acute kidney injury after off-pump coronary artery bypass surgery in patients with a preoperative serum albumin level of less than 4.0 g/dl.
- ◆◆🌐 **Auscultation *versus* Point-of-care Ultrasound to Determine Endotracheal *versus* Bronchial Intubation: A Diagnostic Accuracy Study** 1012  
*D. Ramsingh, E. Frank, R. Haughton, J. Schilling, K. M. Gimenez, E. Banh, J. Rinehart, and M. Cannesson*  
 This prospective, randomized, double-blinded, crossover trial compared the accuracy of detecting bronchial intubation between point-of-care ultrasound and auscultation in 42 adult subjects. The point-of-care ultrasound was a reliable technique to detect bronchial intubation by demonstrating absent contralateral pleural lung sliding on the unintubated side.
- 🌐 **Fibrin Network Changes in Neonates after Cardiopulmonary Bypass** 1021  
*A. C. Brown, R. T. Hannan, L. H. Timmins, J. D. Fernandez, T. H. Barker, and N. A. Guzzetta*  
 Clots formed from blood samples collected from 10 neonates after cardiopulmonary bypass were more porous than clots formed from samples collected before surgery. Clots formed from purified fibrinogen from neonates alone or mixed with adult fibrinogen were less dense than adult clots, suggesting that transfusion of adult fibrinogen may be less effective in neonates than in adults.
- CME ◆◆🌐 **Severe Nausea and Vomiting in the Evaluation of Nitrous Oxide in the Gas Mixture for Anesthesia II Trial** 1032  
 *P. S. Myles, M. T. V. Chan, J. Kasza, M. J. Paech, K. Leslie, P. J. Peyton, D. I. Sessler, G. Haller, W. S. Beattie, C. Osborne, J. R. Sneyd, and A. Forbes*  
 Nitrous oxide increased the risk of severe postoperative nausea and vomiting, more so in Asian subjects; the effect was eliminated by pretreatment with an antiemetic. Severe postoperative nausea and vomiting was associated with fever, poor quality of recovery, and increased hospital stay, indicating that its prevention is clinically important.
- ◆◆🌐 **Tapered-cuff Endotracheal Tube Does Not Prevent Early Postoperative Pneumonia Compared with Spherical-cuff Endotracheal Tube after Major Vascular Surgery: A Randomized Controlled Trial** 1041  
*A. Monsel, Q. Lu, M. L. Corre, H. Brisson, C. Arbelot, C. Vezinet, M.-H. Fléron, C. Ibanez-Estève, F. Zerimech, M. Balduyck, F. Dexheimer, C. Wang, O. Langeron, and J.-J. Rouby*  
 Polyvinyl chloride tapered-cuff endotracheal tubes did not lower the postoperative pneumonia frequency after major vascular surgery. Higher tapered-cuff–pressure variability and higher percentage of time with cuff overinflation were documented. The potential clinical impact of such findings warrants further evaluation.
- ◆ **Adductor Canal Block Provides Noninferior Analgesia and Superior Quadriceps Strength Compared with Femoral Nerve Block in Anterior Cruciate Ligament Reconstruction** 1053  
*F. W. Abdallah, D. B. Whelan, V. W. Chan, G. A. Prasad, R. V. Endersby, J. Theodoropolous, S. Oldfield, J. Oh, and R. Brull*  
 In a randomized trial of 100 subjects undergoing anterior cruciate ligament, analgesia from adductor canal block was not inferior to that of femoral nerve block, but quadriceps muscle strength was superior.

## BASIC SCIENCE

- ◆◆🌐 **Cardiac *Slo2.1* Is Required for Volatile Anesthetic Stimulation of K<sup>+</sup> Transport and Anesthetic Preconditioning** 1065  
*A. P. Wojtovich, C. O. Smith, W. R. Urciuoli, Y. T. Wang, X.-M. Xia, P. S. Brookes, and K. Nehrke*

The authors have used novel gene-deleted mice to demonstrate that K<sup>+</sup> flux *via* the K<sub>Na</sub> Slick channel encoded by the *Slo2.1* gene is required for anesthetic preconditioning in mice. The identification of the role for Slick in anesthetic preconditioning will drive further development of novel cardiac-protective strategies and drugs for the clinical setting.

## ■ CRITICAL CARE MEDICINE

## CLINICAL SCIENCE

- Infusion System Architecture Impacts the Ability of Intensive Care Nurses to Maintain Hemodynamic Stability in a Living Swine Simulator** 1077  
*M. J. Pezone, R. A. Peterfreund, M. Y. Maslov, R. R. Govindaswamy, and M. A. Lovich*

We investigated the ability of skilled intensive care unit registered nurses to overcome pharmacologic delays caused by large infusion system common volumes in a swine model. The data suggest that smaller common volume leads to better hemodynamic control.

## BASIC SCIENCE

- 🌐 **Classically Activated Macrophages Protect against Lipopolysaccharide-induced Acute Lung Injury by Expressing Amphiregulin in Mice** 1086  
*Y. Xu, C. Meng, G. Liu, D. Yang, L. Fu, M. Zhang, Z. Zhang, H. Xia, S. Yao, and S. Zhang*

Amphiregulin was expressed in alveolar macrophages after acute lung injury. Exogenous amphiregulin protected, whereas amphiregulin antibodies exacerbated lung injury. The results are consistent with the notion up-regulation of amphiregulin in activated alveolar macrophages can exert a protective effect on the lung tissue in a model of acute lung injury.

- 🌐 **Mechanical Power and Development of Ventilator-induced Lung Injury** 1100  
*M. Cressoni, M. Gotti, C. Chiurazzi, D. Massari, I. Algieri, M. Amini, A. Cammaroto, M. Brioni, C. Montaruli, K. Nikolla, M. Guanzioli, D. Dondossola, S. Gatti, V. Valerio, G. L. Vergani, P. Pugini, P. Cadringer, N. Gagliano, and L. Gattinoni*

Twenty-four anesthetized piglets ventilated with a range of tidal volume and respiratory rate developed widespread lung injury above a threshold of 12 J/min. This finding suggests that mechanical power applied may be taken into account for ventilator-induced lung injury prevention.

## ■ PAIN MEDICINE

## BASIC SCIENCE

- ◆ **Cerebrospinal Fluid Oxaliplatin Contributes to the Acute Pain Induced by Systemic Administration of Oxaliplatin** 1109  
*Z.-Z. Huang, D. Li, H.-D. Ou-Yang, C.-C. Liu, X.-G. Liu, C. Ma, J.-Y. Wei, Y. Liu, and W.-J. Xin*
- ◆🌐 **Persistent Catechol-*O*-methyltransferase-dependent Pain Is Initiated by Peripheral β-Adrenergic Receptors** 1122  
*B. P. Ciszek, S. C. O'Buckley, and A. G. Nackley*

In rats, sustained administration of a catecholamine-*O*-methyltransferase inhibitor produces hypersensitivity to mechanical and thermal stimuli, which is prevented by peripheral, but not spinal or supraspinal, administration of β-adrenoceptor antagonists, suggesting a peripheral site of action.

-  **Protein Kinase C  $\gamma$  Interneurons Mediate C-fiber–induced Orofacial Secondary Static Mechanical Allodynia, but Not C-fiber–induced Nociceptive Behavior** 1136  
*C. Peirs, N. Bourgois, A. Artola, and R. Dallel*

Static mechanical allodynia was associated with the activation of interneurons in laminae I-II and II-III. Among them were many protein kinase C (PKC)  $\gamma$ -expressing cells of inner lamina II (IIi).  $\gamma$ -Aminobutyric acid receptor type A (GABA<sub>A</sub>) antagonism or reactive oxidative species (ROS) generation are sufficient to induce static mechanical allodynia. GABA<sub>A</sub> agonism, PKC $\gamma$  inhibition, and ROS scavengers prevented static mechanical allodynia. The data are consistent with the premise that sensitization of PKC $\gamma$  interneurons in lamina IIi is required for static mechanical allodynia and that this sensitization is driven by ROS and GABA<sub>A</sub>ergic disinhibition.

- Quaternary Lidocaine Derivative QX-314 Activates and Permeates Human TRPV1 and TRPA1 to Produce Inhibition of Sodium Channels and Cytotoxicity** 1153  
*T. Stueber, M. J. Eberhardt, C. Hadamitzky, A. Jangra, S. Schenk, F. Dick, C. Stoetzer, K. Kistner, P. W. Reeh, A. M. Binshtok, and A. Leffler*

In cells expression human TRPV1 and TRPA1 channels, QX-314 activates both channels and enters the cell to inhibit sodium currents. In these cells, QX-314 produces cytotoxicity by a mechanism dependent on TRPV1 channels.

## ■ EDUCATION

### IMAGES IN ANESTHESIOLOGY

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### ORIGINAL INVESTIGATIONS IN EDUCATION

-   **Evaluation of the Foundation for Anesthesia Education and Research Medical Student Anesthesia Research Fellowship Program Participants' Scholarly Activity and Career Choices** 1168  
 *P. Toledo, S. McLean, L. Duce, C. A. Wong, A. Schubert, and D. S. Ward*

Thirty percent of all the Medical Student Anesthesia Research Fellowship participants were authors on a subsequent publication. Among participants for whom residency information was available, 58% matched into an anesthesiology program.

### REVIEW ARTICLE

-  **Neural Control of Inflammation: Implications for Perioperative and Critical Care** 1174  
*B. E. Steinberg, E. Sundman, N. Terrando, L. I. Eriksson, and P. S. Olofsson*

Neural reflexes modulate systemic inflammation in clinical conditions encountered in perioperative and critical care. This review discusses how recent studies in this area are leading to new therapeutic strategies for the treatment of inflammatory diseases.

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